

Title: SETTLEMENT, GROWTH, AND MIGRATION OF SNAPPERS IN FLORIDA BAY AND ADJACENT MARINE SYSTEMS.

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Project Summary: Florida Bay is a distinct shallow subtropical estuary populated with seagrass and mangrove habitats and a diverse fauna including many commercially and ecologically important species including the gray snapper which is found in great numbers in the bay and adjacent offshore reefs. This estuary is intrinsically linked to the adjacent Gulf of Mexico on one side and the reefs of the bordering Florida Keys and the Atlantic on the other and there is reason to believe that the reefs and the bay play an important role as habitat for these fish at distinct stages of their lives.

The objectives of this study are to examine pre-settlement larval, newly settled, and juvenile stages of gray snapper in Florida Bay and adjacent marine ecosystems in order to investigate the nature of population replenishment by understanding supply and transport of larvae, the size-age structure of juveniles in the bay, their growth rates and migration patterns and how these relate to habitat characteristics and environmental variables such as salinity and temperature and ontogenetic shifts in habitat use. The research proposed herein addresses these questions through a joint effort by CIMAS (Theme 2: Fisheries Dynamics and Theme 3: Coastal Oceans Ecosystems Processes) and NOAA/SEFSC.

In order to accomplish our goals, we will be collecting pre-settlement traps during the peak seasons of recruitment to the bay. We will be

tagging individual juveniles and tracking migrations that may occur in response to changes in environmental parameters or ontogenetic shifts in habitat requirements. We will be using analysis of stable isotopes of $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ to discern variability in growth rates, and exposure to different water masses during the juvenile period. Lastly, we will use otolith ageing and growth increment analysis to obtain estimates of growth rates and discover the ages at which migrations occur as well as to construct an age/growth model for juvenile gray snapper. Ultimately, our aim is to answer the following questions: What is the range of natural variability in population parameters such as recruitment (settlement) and growth, how are these parameters influenced by natural environmental variability, and what is the possible impact of ecosystem changes resulting from South Florida Ecosystem Restoration efforts?

Relevance to
Restoration and/or
Resource
Management:

As directed by NOAA's South Florida Program, we will supply scientific facts essential to constructing realistic models and increasing their predictive abilities to ultimately guide management of Florida Bay and direct Everglades restoration efforts.

Geographic Area:

Florida Bay and Adjacent Marine Systems.